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Art unit: 3673

Examiner: Lagman, Frederick Lyndon

REMARKS/ARGUMENTS**Claim amendment**

Claim 1 is amended to refer to the polymeric resin being an expanding polymeric resin, and claim the polymeric resin permeating the volume of loose granular material and binding the loose granular material together, and the structural support being formed of a contiguous mass of granular material permeated by polymeric resin.

Claim 7 is amended to correct a minor typographical error by replacing the word "prove" with the word "probe".

Claim 9 is amended to indicate that the polymeric resin expands upon injection, per the discussion at paragraph 25 of the specification.

Claim 12 is amended to remove the "s" from the word "claims".

Claims 15 and 19 are amended to claim the polymeric resin being an expanding polymeric resin.

Claim 15 is also amended to remove the reference to "hole", and replace it by "excavation" to provide antecedent reference for later references to "excavation".

Claim 15 is also amended to provide antecedent reference for "granular material".

Claims 1, 9 - 11 and 13 – 15 have been rejected under 35 USC 102(b) as being anticipated by patent no. EP 0 851 064 of Canteri. Applicant respectfully traverses this rejection.

The applicant claims forming a volume of loose granular material, and injecting expanding polymeric resin into the volume of loose granular material, with the polymeric resin permeating the volume of loose granular material and binding the loose granular material together and the

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structural support being formed of a contiguous mass of granular material permeated by polymeric resin.

Canteri discloses none of these features.

First, Canteri does not form a volume of loose granular material. Canteri just forms a hole (col. 2, lines 49-51) and does not form a volume of loose granular material.

Second, Canteri does not disclose expanding polymeric resin permeating a volume of loose granular material or structural support being formed of a contiguous mass of granular material permeated by expanded polymeric resin. Rather, the expansion of Canteri's foam causes compaction of the surrounding soil (col. 2, lines 24-26, col. 3, lines 45-51 and col. 5, lines 21-25), and it is this treatment of the soil that causes the compacted soil to be the structural support (col. 5, lines 47-51). Canteri refers to possible agglomeration of loose parts, but a few fragments of soil parts in a foam does not yield the claimed invention.

Therefore, claim 1 is not anticipated by Canteri. Therefore, claims 8 – 10 and 12 – 14, being dependent on claim 1, are also not anticipated by Canteri.

Moreover, Canteri teaches away from the approach taken by the applicant by teaching the compacting of soil by pushing out injected chemicals into nearby soil.

Therefore, claim 1, and claims 8 – 10 and 12 – 14, being dependent on claim 1, are not obvious in view of Canteri.

Claims 2 – 7, 12, and 16 – 23 have been rejected under 35 USC 103(a) as being unpatentable over EP 0 851 064 to Canteri in view of Goughnour US Patent no. 5,279,502. Applicant respectfully traverses this rejection.

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In relation to claims 2-7 and 11, neither Canteri nor Goughnour teach or suggest applicant's first step in claim 1 of forming a volume of loose granular material in soil.

As explained above, Canteri teaches compacting soil by pushing out injected chemicals into nearby soil. Goughnour teaches compacting granular or stone material in soil to increase load-bearing capacities and/or to provide drainage. Both create holes, but don't create a loose volume of granular material. Neither Canteri nor Goughnour teach applicant's first step. Hence, the combination of the two references does not yield the invention.

Moreover, neither cited reference teaches placing loose granular material in the hole. In fact, Goughnour's entire approach is to inject compacted and not loose granular material, which is completely different from the claimed invention.

Canteri, by teaching compacting soil by pushing out injected chemicals into nearby soil, and Goughnour, by teaching compacting granular or stone material in soil to increase load-bearing capacities and/or provide drainage, both teach away from the applicant's approach.

Hence, claims 2-7 and 11 are patentable over Canteri and Goughnour.

In claim 15 the applicant claims injecting back-filled crushed rock or gravel in an excavation with an expanding polymeric resin. Canteri does not teach back-filling of an excavation with crushed rock or gravel. Goughnour does not teach injection of anything with an expanding polymeric resin. There is, further, no motivation to combine the references, ie inject Goughnour's stone column with Canteri's foam. The references themselves teach away from such a step. It is submitted that one would expect from Canteri that the injection of the expanding polymeric foam would push apart the stone column, rather than create a structural friction pile. Goughnour itself refers to injection of a cement (cementitious grout, col. 7, lines 33-35), but a cement sets up over a long time, and thus has time to permeate the column before curing. With expanding polymeric foam, it is submitted that one could not expect the foam to permeate the

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compacted stone column without curing too soon and preventing the completion of the friction pile. Hence, it is submitted that claim 15 is not obvious over Canteri in view of Goughnoor.

In claim 19, the applicant claims a first step of agitating a base soil. Neither Canteri nor Goughnoor teach or suggest such a step. Both references are directed at compaction of materials rather than agitation of materials, which tends to loosen them. The combination of the references does not yield the invention, and there is nothing in either of them to suggest agitating a base soil. To the contrary, both teach away from agitating a base soil because they teach compaction of materials.

Therefore, none of claims 1, 15 or 19 are obvious in view of Canteri and Goughnour. Thus, none of claims 3 – 7 and 11, being dependent on claim 1, claims 16 – 18, being dependent on claim 15 and claims 20 – 22, being dependent on claim 19, are obvious in view of Canteri and Goughnour.

Reconsideration and withdrawal of the rejections, and allowance of the claims, is respectfully requested.

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